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{ REPORT
101-188

COLLISION AVOIDANCE SYSTEM FOR
COMMERCIAL AIRCRAFT

Mr. HOLLINGS, from the Committee on Commerce, Science,
and Transportation, submitted the following

R E P O R T

OF THE

SENATE COMMITTEE ON COMMERCE,
SCIENCE, AND TRANSPORTATION

ON

H.R. 2151



NOVEMBER 2 (legislative day, SEPTEMBER 18), 1989.—Ordered to be printed

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COLLISION AVOIDANCE SYSTEM FOR COMMERCIAL
AIRCRAFT

NOVEMBER 2 (legislative day, SEPTEMBER 18), 1989.—Ordered to be printed

Mr. HOLLINGS, from the Committee on Commerce, Science, and
Transportation, submitted the following

REPORT

[To accompany H.R. 2151]

The Committee on Commerce, Science, and Transportation to which was referred the bill (H.R. 2151) to amend the Federal Aviation Act of 1958 to establish a schedule for the installation in certain civil aircraft of the collision avoidance system known as TCAS-II, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

PURPOSE OF THE BILL

The bill, as reported, authorizes the Administrator of the Federal Aviation Administration (FAA) to extend the current compliance deadline for installing TCAS-II by two years, to December 30, 1993, if the administrator determines that such an extension is necessary. The bill mandates a year-long operational evaluation of the Traffic Alert and Collision Avoidance System known as TCAS-II beginning not later than December 30, 1990. The bill also extends the FAA civil penalty assessment demonstration program by two years, to December 30, 1991.

BACKGROUND AND NEEDS

TCAS-II COMPLIANCE

The TCAS system is designed to provide the flight crew of a commercial aircraft with information relating to the bearing and altitude of nearby aircraft. TCAS instructs the crew through visual

and aural resolution advisories on how to avoid threatening traffic, provided that the other traffic is equipped with similar equipment or altitude-encoding transponders, such as the Mode C transponder. TCAS-II provides vertical directives to avoid conflict, while the more advanced TCAS-III will provide both horizontal and vertical directives. The system is independent of ground-based air traffic control, as all TCAS equipment is carried in the aircraft.

While mid-air collisions involving aircraft are extremely rare, their consequences are catastrophic. In the past 11 years, there have been 4 mid-air collisions involving commercial aircraft which resulted in 253 deaths. In 1987, during consideration of the Airport and Airway Safety and Capacity Expansion Act (Public Law 100-223), Congress responded to these four incidents, as well as the growing number of reported near mid-air collisions, by requiring that TCAS-II be installed on all commercial aircraft with more than 30 seats by not later than December 30, 1991.

In late 1988, the FAA and the airline industry began expressing concerns about two aspects of the TCAS-II installation schedule mandated in Public Law 100-223. Specifically cited were the need for an operational evaluation and test of TCAS-II prior to widespread installation, and the lack of sufficient industry maintenance, engineering, and technical capabilities to comply with the statutory installation deadline without disrupting passenger service. Senator Ford, chairman of the Aviation Subcommittee, subsequently requested that the Office of Technology Assessment (OTA) evaluate these concerns and report back to the Committee.

OTA's February 1989 report concluded that aviation safety would best be served through a structured joint FAA/industry evaluation program to oversee the first year of TCAS-II operation. This recommendation arose from the fact that the FAA has not examined how TCAS-II will perform in an environment where numerous other aircraft have been outfitted with this equipment. Nor has the FAA or the airline industry had the opportunity to evaluate how large numbers of airline pilots and the ground based air traffic control system will respond in a system with large numbers of TCAS-II equipped aircraft.

OTA also concluded that sufficient airline resource limitations, economic inequities, and international implications arise from the current compliance deadline for Congress to consider extending the installation schedule. OTA cited the fact that TCAS manufacturers must produce and deliver the equipment, airlines must redesign and modify aircraft, and the FAA must certify the equipment and altered aircraft. Also recognized was the fact that the airlines are facing requirements to install new wind shear detection and guidance equipment as well as undertake major maintenance on older aircraft during the same period as they install TCAS-II. In its report, OTA concluded that "delays, especially facing commuter and special configuration aircraft, will probably prevent 100 percent compliance. Moreover, some airlines will endure greater economic hardship than others in meeting the deadline."

Legislation is needed to address the concerns that have come to light since Congress acted in 1987 to establish the original installation schedule for TCAS-II. Through OTA, industry and government have developed a consensus on the need for a structured evaluation

program of the TCAS system, as well as modification of the current compliance deadline. This legislation authorizes the FAA Administrator to provide such flexibility to extend the TCAS-II installation compliance deadlines, if the Administrator determines such a change is necessary. The bill also mandates a year-long operational evaluation of this collision avoidance equipment to assess interaction between a significant number of TCAS-II equipped aircraft and to measure its impact on the air traffic control system.

CIVIL PENALTY ASSESSMENT DEMONSTRATION PROGRAM

In 1987, in an effort to provide the FAA with tools needed to strengthen its safety and security enforcement efforts, Congress established the civil penalty demonstration assessment program. Under the provisions of Public Law 100-223, the Administrator is authorized to assess a civil penalty not to exceed \$50,000 for violations arising under the Federal Aviation Act of 1958, or any rule, regulation, or order issued thereunder. Persons assessed with such a civil penalty are provided the opportunity to have their cases heard before an administrative law judge rather than having to undergo a trial in U.S. District Court. The demonstration program was authorized for a period of two years from the date of enactment and, therefore, expires on December 30, 1989.

Prior to the enactment of this demonstration program, the FAA could propose, but could not administratively prosecute, a civil penalty action for any violation. The FAA was forced to refer the case to the U.S. Attorney for a prosecution in Federal district court. The process of initiating civil penalty cases in U.S. District Court was lengthy and laborious, and because of higher priority matters, resulted in many cases not being pursued.

The FAA sought the statutory authority to hold administrative hearings for civil penalty cases in order to provide for more effective and efficient enforcement of the Federal Aviation Act of 1958 and the Federal Air Regulations (FAR). After a delay in initiating the rulemaking process, the demonstration program became effective September 7, 1988. From that date through June 22, 1989, the FAA initiated a total of 2,941 cases under the demonstration program. The majority of these cases has been initiated for security violations (65.5 percent), flight operations (15.1 percent), and maintenance violations (9.9 percent). Of the 2,941 cases initiated under the demonstration program, only 302, or approximately 10 percent, have been closed through payment of a fine to the FAA. Only a small percentage of the cases has progressed to a full resolution, and no single case has reached the appeal level where the administrative law judge's initial decision may be reviewed by the Administrator.

While the demonstration program has received considerable opposition from the aviation industry, particularly with respect to the procedures under which the implementing regulations were promulgated, FAA statistics show that it is providing an effective and efficient enforcement process for prosecuting relatively modest civil penalty actions related to aviation safety and security violations. This legislation extends the civil penalty demonstration program by two years, to December 30, 1991. This extension will provide the

FAA with added time for a greater number of cases to undergo the full hearing and appeal process and will afford Congress the opportunity to determine the success of the program based on a more complete record.

LEGISLATIVE HISTORY

H.R. 2151 was introduced on April 27, 1989, by Representative Packard. The bill was reported by the House Committee on Public Works and transportation by a voice vote on July 20, and it passed the House of Representatives on August 1, 1989.

In the Senate, the bill was referred to the Committee on Commerce, Science, and Transportation. On October 5, 1989, the Commerce Committee met in open executive session to consider H.R. 2151. After adopting an amendment by Senator Ford extending the FAA civil penalty assessment demonstration program, the Committee ordered the bill reported on a voice vote without objection.

SUMMARY OF MAJOR PROVISIONS

As reported:

1. The bill directs the Administrator to institute a year-long operational evaluation of the TCAS-II collision avoidance system beginning not later than December 30, 1990.

2. The bill authorizes the Administrator to extend the current compliance deadline for installing TCAS-II by up to two years, to December 30, 1993, if the FAA Administrator determines that such an extension is necessary to promote a safe and orderly transition to a fully-equipped TCAS-II fleet, or to promote other safety objectives. The Administrator is authorized to extend the compliance deadline beyond two years if such action is found to be necessary to promote safety and if the authorizing committees are notified 90 days in advance.

3. The bill directs the Administrator to consider the feasibility and desirability of amending the installation schedule of airborne windshear detection equipment to make it compatible with the TCAS-II compliance schedule.

4. The bill also extends for two years, to December 30, 1991, the FAA's civil penalty assessment demonstration program.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, October 12, 1989.

Hon. ERNEST F. HOLLINGS,
Chairman, Committee on Commerce, Science, and Transportation,
U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has reviewed H.R. 2151, an act to amend the Federal Aviation Act of 1958 to establish a schedule for the installation in certain aircraft

of the collision avoidance system known as TCAS-II, and for other purposes, as ordered reported by the Senate Committee on Commerce, Science, and Transportation, October 5, 1989. We estimate that implementation of this legislation would cost the federal government \$6 million to \$7 million, primarily in fiscal year 1990, assuming appropriation of the necessary funds.

H.R. 2151 would require the Administrator of the Federal Aviation Administration (FAA) to institute (not later than December 30, 1990) a one-year program to evaluate the collision avoidance system known as TCAS-II (Traffic Alert and Collision Avoidance System). The act would also allow the Administrator to extend the deadline for the installation and operation of TCAS-II by up to two years; the deadline could be further extended if the Administrator properly notifies the appropriate Congressional committees. H.R. 2151 would also require the Administrator to consider the feasibility and desirability of amending the schedule for the installation of airborne low-altitude windshear equipment in order to make it compatible with the schedule for the installation of TCAS-II. In addition, the act would extend the civil penalty assessment demonstration program for two years, until December 30, 1991.

Based on information from the FAA, CBO estimates that implementation of this legislation would result in costs to the federal government of \$6 million to \$7 million to purchase, operate and analyze information from recording devices that would monitor certain cockpit and air traffic facility readings in order to evaluate TCAS-II. We anticipate that such costs would be incurred primarily in fiscal year 1990. It is possible that some of these costs would be incurred without this legislation, since the FAA might perform some type of evaluation of TCAS-II prior to its full implementation in any event. There would be no significant cost to the federal government associated with the other provisions of H.R. 2151.

No costs would be incurred by state or local governments as a result of enactment of this legislation.

If you wish further details on this estimate, we will be pleased to provide them. The CBO staff contact is Mitchell Rosenfeld.

Sincerely,

ROBERT D. REISCHAUER,
Director.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported.

NUMBER OF PERSONS COVERED

As mandated by Public Law 100-223, all commercial aircraft operating in the United States with more than 30 seats must be equipped with TCAS-II collision avoidance equipment by not later than December 30, 1991. According to the FAA, there are 3,365 existing aircraft now in service and 3,100 aircraft expected to be manufactured by the year 2003 which will be required to be equipped with TCAS-II. This legislation authorizes the FAA Administrator to extend the current compliance deadline for installing TCAS-II

by two years, if the Administrator determines that such an extension is necessary.

The bill also provides for a two-year extension of the civil penalty assessment demonstration program. This program is applied by the FAA to all sectors of the aviation industry covered by the Federal Aviation Act of 1958 and FAR as a tool for enforcing safety and security standards.

ECONOMIC IMPACT

Extending the TCAS-II installation compliance deadline will save the airline industry and travelers substantial sums of money. The airline industry has testified before the Aviation Subcommittee of the House Committee on Public Works and Transportation that complying with the current date will necessitate the removal of approximately 650 aircraft from revenue service, a burden which would not be shared equitably by all airlines. In its review of the matter, OTA concluded that an additional 1,000 technicians would be needed by the airline industry to meet the TCAS workload without overtime or cutting back on other maintenance activities. Typically, these costs are borne in part by the air carrier and partially passed on to air travelers.

PRIVACY

This legislation will not have any adverse impact on the personal privacy of the individuals affected.

PAPERWORK

The bill directs the Administrator to institute a year-long operational evaluation of the TCAS-II collision avoidance system in order to collect and assess safety and operational data from civil aircraft equipped with such system. The additional paperwork required by industry participation in this program may be significant, but is outweighed by the potential benefit of ensuring the development of a collision avoidance system capable of safely and successfully interacting in the air traffic control system with other aircraft.

The Committee anticipates that there will be no increase in the paperwork burden resulting from a two-year extension of the civil penalty assessment demonstration program, which was first established by Congress in 1987.

SECTION-BY-SECTION ANALYSIS

SECTION 1.—INSTALLATION AND EVALUATION OF COLLISION AVOIDANCE SYSTEMS

This section amends section 601(f) of the Federal Aviation Act of 1958 by adding new provisions to current law requirements relating to the installation of collision avoidance systems.

New paragraph (3) directs the Administrator, beginning not later than December 30, 1990, to institute a year-long program for the operational evaluation of the collision avoidance system known as TCAS-II, in order to collect and assess safety and operational data from the civil aircraft equipped with such system. In conducting

the program, the Administrator is directed to encourage the participation of foreign air carriers which operate civil aircraft equipped with such system.

New paragraph (4) provides the Administrator with the authority to extend the current deadline for installation of TCAS-II collision avoidance equipment for a period not to exceed two years if the Administrator determines that such an extension is necessary to promote a safe and orderly transition to the operation of a fleet of civil aircraft equipped with TCAS-II, or to promote other safety objectives. The Administrator is authorized to further extend the deadlines beyond two years if the Administrator determines that such further extension is necessary to promote safety, and notifies, in writing, the Committee on Public Works and Transportation of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate of such extension at least 90 days before it is to take effect.

Given the critical need for the safety enhancements offered by this equipment, the Committee expects the Administrator and the industry to pursue installation of the TCAS-II as soon as possible. The Commission concurs with OTA that there is no reason to delay initial implementation of the TCAS-II system. Additionally, the Committee strongly urges the FAA to establish and adhere to a phased-in compliance schedule similar to that recommended by OTA in its report to Congress and proposed by the FAA in its July 10, 1989 notice. Such an approach will not only benefit safety but will ensure that a critical number of aircraft are outfitted with TCAS-II at an early date, thus enabling the type of structured evaluation program recommended by OTA.

New paragraph (5) directs the Administrator to consider the feasibility and desirability of amending the schedule for installation of airborne low-altitude windshear equipment in order to make such schedule compatible with the schedule for the installation of the TCAS-II collision avoidance system.

SECTION 2.—CIVIL PENALTY ASSESSMENT DEMONSTRATION PROGRAM

Section 2 amends section 905(d)(4) of the Federal Aviation Act of 1958, which established a two-year effective period for the civil penalty assessment demonstration program, by extending the program until December 30, 1991. This provision grants FAA the authority to assess civil penalties by means of an administrative process when the amount in controversy is less than \$50,000.

The Committee strongly supports the FAA in its efforts to enhance compliance in order to ensure safety. The Committee recognizes that aggressive enforcement against those who knowingly and willingly violate safety regulations is an indispensable tool to assure compliance.

The Committee strongly supports the efforts of the Secretary of Transportation and the Administrator of the FAA in promoting compliance, while at the same time striving to avoid an adversarial relationship between the FAA and those who attempt in good faith to adhere to safety regulations. Aviation safety depends heavily on cooperation between users and regulators. The Committee believes

that compliance is the surest way of enhancing safety and that litigation can stand in the way of this goal.

Formal adjudications or findings of guilt may have consequences far beyond the specific offense and can lead to protracted litigation. In these cases where the violation is inadvertent and the individual displays a favorable compliance disposition, payment of a civil penalty without formal findings or adjudication accomplishes safety objectives without placing users and the FAA in an adversarial role. In this regard, it is the Committee's intention to provide the Administrator with sufficient latitude to assure compliance in a fair and expeditious manner.

The Committee is aware that there is significant industry opposition to the civil penalty assessment demonstration program, particularly with respect to the manner in which the final rule was promulgated and to related trial provisions and practices. In March 1989, a motion was filed to stay actions initiated under the regulations promulgated by the FAA for the demonstration program (*Air Transport Association of America, et al. v. Department of Transportation*). The enabling legislation, passed in 1987, directs the FAA to comply with the requirements of title 5, United States Code, in prosecuting these cases. The purpose behind this requirement was to alert the FAA to the level of procedural formality in these proceedings, and to ensure protection of the due process rights of parties charged by the FAA with a violation. In the conference report accompanying Public Law 100-223, language accompanying this demonstration program explicitly referenced the importance of maintaining the due process rights for alleged violators. The Committee expects the FAA to pursue diligently this objective during this two-year extension.

The FAA has stated that it will monitor and evaluate the adequacy and efficacy of the procedures under which the program was established, as well as the rule of practice, and will make adjustments where appropriate. The Department of Transportation has asked the Administrative Conference of the United States to conduct an impartial review of the demonstration program and the applicable hearing procedures. The Committee understands that the FAA will consider the results of this review and will act expeditiously on any recommendations to ensure that the FAA's procedural rules are balanced and fair and satisfy the procedural due process requirements. The Committee will carefully review the manner in which this program is conducted during the period of this extension. If necessary, we will revisit this program in hearings to be held during the Second Session of the 101st Congress on legislation to extend authorizations under the Airport and Airway Improvement Act of 1982.

As a part of its examination, the Committee expects the FAA to review its current regulatory system which imposes civil penalties on publicly-owned airports for the acts and omissions of airport tenants on the basis of strict liability without any finding of fault or culpability by the airport sponsor. Public airports seldom incur civil penalties in excess of \$50,000, and therefore fall under the demonstration program. In 1987, at the urging of this Committee, the FAA correctly modified the airport certification regulation (FAR Part 139) to discontinue holding airport operators responsible

for monitoring the safety of tenant fueling operations not under the airport's direct control. The Committee urges the FAA to reconsider its policy of assigning liability solely to airport operators for FAR Part 107 violations by airport tenants.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in *italic*, existing law in which no change is proposed is shown in roman):

FEDERAL AVIATION ACT OF 1958

Section 601 of that Act

GENERAL SAFETY POWERS AND DUTIES

MINIMUM STANDARDS; RULES AND REGULATIONS

SEC. 601. (a) * * *

(b) through (e) * * *

(f) COLLISION AVOIDANCE SYSTEMS.—

(1) DEVELOPMENT AND CERTIFICATION.—

(A) STANDARDS.—The Administrator shall complete development of the collision avoidance system known as TCAS-II so that such system will be operable under visual and instrument flight rules and will be upgradable to the performance standards applicable to the collision avoidance system known as TCAS-III.

(B) SCHEDULE.—The Administrator shall develop and implement a schedule for development and certification of the collision avoidance system known as TCAS-II which will result in completion of such certification not later than 18 months after the date of the enactment of this subsection.

(C) MONTHLY REPORTS.—The Administrator shall transmit to Congress monthly reports on the progress being made in development and certification of the collision avoidance system known as TCAS-II.

(2) INSTALLATION.—The Administrator shall require by regulation that, not later than 30 months after the date of certification of the collision avoidance system known as TCAS-II, such system be installed and operated on each civil aircraft which has a maximum passenger capacity of more than 30 seats and which is used to provide air transportation of passengers, including intrastate air transportation of passengers.

(3) OPERATIONAL EVALUATION.—*The administrator shall institute, for a 1-year period beginning not later than December 30, 1990, a program for the operational evaluation of the collision avoidance system known as TCAS-II, in order to collect and assess safety and operational data from the civil aircraft equipped with such system. In conducting the program, the Administrator shall encourage the participation of foreign air carriers which operate civil aircraft equipped with such system.*

(4) *EXTENSION OF TIME.*—If the Administrator determines that extending the deadline contained in paragraph (2) is necessary—

(A) to promote a safe and orderly transition to operation of a fleet of civil aircraft described in paragraph (2) which is equipped with the collision avoidance system known as TCAS-II, or

(B) to promote other safety objectives, the Administrator may extend such deadline for a period not to exceed 2 years; except that the Administrator may further extend such deadline if the Administrator determines that such further extension is necessary to promote aviation safety and notifies, in writing, the Committee on Public Works and Transportation of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate of such extension at least 90 days before such extension is to take effect.

(5) *COMPATIBILITY OF WINDSHEAR EQUIPMENT INSTALLATION SCHEDULE.*—The Administrator shall consider the feasibility and desirability of amending the schedule for the installation of airborne low-altitude windshear equipment in order to make such schedule compatible with the schedule for the installation of the collision avoidance system known as TCAS-II.

[(3)] (6) *TRANSPONDERS.*—Not later than 6 months after the date of the enactment of this subsection, the Administrator shall promulgate a final rule requiring the installation and use of operating transponders with automatic altitude reporting capability for aircraft operating in designated terminal airspace where radar service is provided for separation of aircraft. For such terminal airspace, other than Terminal Control Areas and Airport Radar Service Areas, the Administrator may provide for access to such airspace by nonequipped aircraft if the Administrator determines that such access will not interfere with the normal traffic flow. Such final rule shall require the installation and use of such transponders not later than 36 months after the date of the enactment of this subsection.

Section 905 of that Act

SEC. 905. CIVIL PENALTY ASSESSMENT DEMONSTRATION PROGRAM.

(a) through (c) * * *

(d) *LIMITATIONS.*—

(1) *HEARING.*—A civil penalty may be assessed under this section only after notice and opportunity for a hearing on the record in accordance with section 554 of title 5, United States Code.

(2) *VIOLATIONS.*—This section only applies to civil penalties initiated by the Administrator after the date of the enactment of this section.

(3) *MAXIMUM AMOUNT.*—The maximum amount of a civil penalty which may be assessed under this section in any case may not exceed \$50,000.

(4) **EFFECTIVE PERIOD.**—The provisions of this section [shall only be in effect for the 2-year period beginning on the date of the enactment of this section] *shall remain in effect until December 30, 1991.*

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